CYCLUS MARTINENSIS SP. NOV. (CRUSTACEA) FROM THE UPPER VISÉAN OF THE MENDIP HILLS, ENGLAND

by R. GOLDRING

ABSTRACT. A new species of *Cyclus* is described which is closest to *C. harknessi* Woodward and *C. woodwardi* Reed. The latter is refigured. The specimens occur between the corallites of either phaceloid *Lithostrotion* or *Syringopora*, and this appears to have been their habitat.

A NUMBER of well-preserved shields of the problematical crustacean *Cyclus* de Koninck have been prepared by Mr. C. B. Salter of Bristol from loose blocks of highly fossiliferous Carboniferous Limestone from near Compton Martin, on the north slope of the Mendip Hills. The blocks are from the Viséan, Hotwells Limestone, as mapped by the Geological Survey and shown on sheet 280 (1963), and exposed in Cliff Quarry (Nat. Grid Ref. ST 541568), a quarter of a mile south-west of Compton Martin church (Green and Welch 1965, p. 27, with additional stratigraphic detail).

Each specimen of the cyclid, which is a new species, has been found between the corallites of either a phaceloid *Lithostrotion* or *Syringopora sp.* The coral is evidently not in a growth position, but judging from the fineness of preserved detail, which characterizes the whole fauna, it cannot have travelled far. Mr. Salter considers that the cyclid might well go unnoticed in rock which did not break down in a similar way to that at Compton Martin. Only a small percentage of one bed of rubbly limestone breaks down to a workable condition permitting the separation of the individual corallites and close examination of the matrix. The gastropods from the same bed have been described by Dr. R. Batten (1966). The association of the cyclid with the coral is too constant to be fortuitous and it seems likely that coral thickets were the habitat of the species. Hopwood (1925, p. 301), following Woodward (1894, p. 535), suggested an ectoparasitic mode of life, with the development of suckers, for the flatter cyclids from the Coal Measures. Although suckers would likely be useful amongst the corallites there is no morphological evidence for their presence in the present species, though the closely situated anterior lobes, which are comparatively larger than in any other known species of *Cyclus*, may have been associated with a sucker structure. The breadth of the specimens is similar to the breadth of the corallites, but the base of the exoskeleton is flat and not transversely curved.

Other species of *Cyclus*, in particular the type species *C. radialis* Phillips, occur in the 'reef knolls' of northern England with apparently a different palaeoecological association. From an examination of specimens in the collections of the British Museum (Natural History) and of the Geological Survey Museum *C. radialis* is associated with fenestellid bryozoa and a 'reef fauna'.

The zoological affinities of the Cyclidae have been discussed by several workers. Unfortunately it is only in the flatter species from the Upper Carboniferous such as

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C. johnsoni Woodward 1894 that the appendages are known. This and other species were assigned to the Triassic genus *Halicyne* von Meyer by Hopwood (1925), but Trümpy (1957) and Glaessner (personal communication) consider that this is incorrect, and it would seem likely that these species should be assigned to a new genus. Trümpy summarized present views on the affinities of the Cyclidae: 'On the one hand, the cyclids call to mind certain representatives of the palaezoic Phyllocarida, such as *Aristozoe* or the Discinocaridae. . . . On the other hand, Hopwood's investigation of the anatomical characters makes it not unlikely that there is a relationship with the Copepoda, or rather with the ectoparasitic Branchiura, whose best-known living representative is the carplouse *Argulus*.' (Translation.) Professor Glaessner has kindly informed me that for his contribution on the Cycloidea in Part R of the 'Treatise on Invertebrate Paleontology' he has had to conclude that their systematic position is uncertain.

For continuity, the terminology is, in the main, that used by Reed 1893.

Superfamily CYCLOIDEA Glaessner 1928
Family CYCLIDAE Packard 1885
Genus CYCLUS de Koninck 1841

Several workers have made typographical errors or introduced an incorrect subsequent spelling referring to *Cyclas* Lamarck 1798 as *Cyclus*. These are given in Neave (1939). Anton (1837) described a number of species of mollusc including one referred to as *Cyclus modioliformis*, which followed another named *Cyclas maculata*. Neave does not note that this is also an error for *Cyclas*, but Dr. J. Bowden and Dr. W. D. I. Rolfe (University of Glasgow) have kindly pointed out that Anton (1839, p. 14) referred both species to *Cyclas*. Thus, as with the others, this change is not a demonstrably intentional emendation and has no status in nomenclature (I.C.Z.N., Art. 33(b)). *Cyclus* de Koninck has priority.

Cyclus martinensis sp. nov.

Plate 51, figs. 1–8

Derivation of name. From Compton Martin, Somerset.

Holotype. Geological Survey Museum 102638.

Measurements of holotype (in mm.). Length (sag.) 6·0, breadth 4·25, height 2·0.

Paratypes. GSM 102639–102646, 102647, 103088.

Diagnosis. Exoskeleton oval and moderately inflated (horseshoe form when complete), comprising a horseshoe band of ribs enclosing narrower bands of the outer and inner

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EXPLANATION OF PLATE 51

Figs. 1–8. *Cyclus martinensis* sp. nov. 1, 2, 5, 7, Holotype, anterior, plan, posterior, and right lateral views, GSM 102638, ×5. 3, 8, Plan and right lateral views, GSM 102647, ×5. 4, Anterior view of incomplete specimen, GSM 102639, ×10. 6, Left lateral view showing margin, GSM 102640, ×5.

Figs. 9–12. *Cyclus woodwardi* Reed 1893. Holotype, right lateral, anterior, plan, and posterior views, Sedgwick Museum E 3725, ×4.

Figs. 13–15. *Heterostegina adamsi* sp. nov. Sample DJ.742, Gerigoan Hill, Somalia; Upper Palaeocene. 13, Holotype, P46427, equatorial section of megalospheric form, ×50. 14, Equatorial section of microspheric form, ×50. 15, Axial section, ×80.


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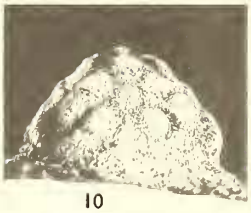
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GOLDRING, *Cyclus*
EAMES and CLARKE, Palaeocene *Heterostegina*

forks. A median, anteriorly expanding ridge bisects the shield. It merges into a median lobe anteriorly of which is a group of four lobes. The first pair is low, but the anterior pair is prominent and spheroidal.

Description. The margin in each specimen attributed to the species is incomplete and in only one, otherwise fragmentary specimen, are the antero-lateral areas preserved. It is considered that the outline of a complete specimen would be close to horseshoe form with slight outward bows to the antero-lateral margins, but in the usual preservation the outline is oval with the greatest breadth (trans.) at approximately half length. The slope is steeper posteriorly than anteriorly.

Holotype (Pl. 51, figs. 1, 2, 5, 7). Lateral outline a depressed arch, with height about one-third length and with base horizontal. Posterior half with fairly even curve broken midway by shallow re-entrant. Outline of anterior half with globular anterior lobes succeeded by short slope to low arch of median lobe. Ribs rather greater than half height.

The greater part of the shield comprises three enclosing bands, the ribs and outer and inner forks, situated symmetrically about the median ridge. The posterior one-fifth length of the ridge is very narrow. It comprises a line of tubercles and is scarcely elevated above the general level of the exoskeleton. Approaching the margin the line of tubercles bifurcates sharply at 140°. Anteriorly it gradually broadens to almost one-fifth the overall breadth and merges without restriction into the median lobe just anterior to half length. The maximum breadth of the ridge corresponds to the breadth of the median lobe. Beyond this lobe, continuing the expansion of the ridge, is a group of five lobes. Anterior to the median lobe are two small ill-defined lobes separated sagittally and from the forks by weak furrows. The two globular anterior lobes dominate the anterior portion of the shield. Slightly flattened spheroids they face outwards and upwards and are separated by a deep, narrow furrow.

Where the median ridge begins to expand the bands of the outer fork diverge; the outer edge of each band curving anteriorly and paralleling the outer margin of the shield. The band tapers slightly anteriorly, from 1·0 mm. (exsag.), at the divergence from the median ridge, to 0·5 mm. (trans.) at the termination opposite the median lobe and just anterior to the maximum breadth of the exoskeleton. The line of the fork is continued anteriorly by a tear-shaped lobe, separated from the fork by a sharp furrow directed postero-laterally.

Between the outer fork and the median ridge, the inner fork comprises a pair of straight narrow ridges converging acutely to meet the median ridge and anteriorly merging into the lobes anterior to the median lobe. The inner fork is separated from the median ridge by a fine groove and from the outer forks by a broad groove.

There are seven ribs on each side. The posterior five ribs are even bands almost normal to the margin of the shield curving outwards and very slightly anteriorly. The ribs are separated from each other and from the outer fork by broad grooves which expand outwards. The posterior pair and the pair at maximum breadth, are half as broad again as the others. The pair anterior to the maximum breadth is shorter (trans.) and subtriangular, and bounded by deeper furrows. A sharp re-entrant to the outline is present between this rib and the anterior lobes, and a narrow rib half the length (trans.) of the adjoining rib joins the apex of the re-entrant.